

## WHAT IS CLAIMED IS:

Sub  
a  
5 1. A temperature-independent arrayed waveguide grating, comprising an arrayed waveguide grating composed of one or a plurality of input waveguides, an input slab waveguide including an input side and an output side, said input side receiving light from said input waveguides, a plurality of arrayed waveguides including an input side and an output side, said input side being connected to said output side of said input slab waveguide, an output slab waveguide including an input side and an output side, said input side being connected to said output side of said arrayed waveguides,

10 a plurality of output waveguides connected to said output side of said output slave waveguides;

a wedge-shaped groove formed in a said arrayed waveguides; and

15 material filled in said groove, said material having a negative refractive index temperature coefficient; wherein

means disposed in said groove for confining light incident to said groove in a horizontal direction or in vertical and horizontal directions and for thereby preventing the light from spreading in said groove.

2. The temperature-independent arrayed waveguide grating in accordance with claim 1, wherein:

said material filled in said groove is a photosensitive material; and

5 difference in a refractive index is provided in said material using the photosensitivity, and optical waveguides are thereby formed in said material in a horizontal direction or in vertical and horizontal directions.

3. The temperature-independent arrayed waveguide grating in accordance with claim 1, wherein said material filled in said groove has a refractive index higher than that of material of said arrayed waveguide grating.

4. The temperature-independent arrayed waveguide grating in accordance with claim 1, wherein width of each core of said arrayed waveguides is enlarged before and after said groove.

5. The temperature-independent arrayed waveguide grating in accordance with claim 1, wherein:

said material filled in said groove is a photosensitive material having a refractive index higher than that of material of said arrayed waveguide grating; and

difference in a refractive index is provided in said material using the photosensitivity and optical waveguides are thereby formed in said material in a vertical direction or in vertical and horizontal directions.

6. The temperature-independent arrayed waveguide grating in accordance with claim 1, wherein:

said material filled in said groove has a refractive index higher than that of material of said arrayed waveguide grating; and

width of each core of said arrayed waveguides is enlarged before and after said groove.